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Urban escalators and inter-regional elevators: the difference that location, mobility and sectoral specialisation make to occupational progression

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Abstract

This paper uses evidence from the Longitudinal Study for England/Wales to examine the influence on occupational advancement of the city-region of residence (an escalator effect) and of relocation between city-regions (an elevator effect). It shows both effects to be substantively important, though less so than the sector of employment. Elevator effects are found to be associated with moves from slacker to tighter regional labour markets. Escalator effects, on the other hand, are linked with residence in larger urban agglomerations, though not specifically London, but also across most of the Greater South East and in second/third order city-regions elsewhere. Sectoral escalator effects are found to be particularly strong in knowledge-intensive activities, with concentrations of these, as of other advanced job types (rather than of graduate labour), contributing strongly to the more dynamic city-regional escalators. The impact of the geographic effects is found to vary substantially with both observed and unobserved personal characteristics, being substantially stronger for the young and for those whose unobserved attributes (e.g. dynamic human capital) generally boost rates of occupational advance.

1. Introduction

The 'resurgence of cities' announced around the time of the millennium, in countries which had been early adopters of mass urbanisation but where for some decades it had gone out of fashion, owed much to the sense that in these societies (as well as in the newly urbanising global south) this was where bright young people wanted to live. That enthusiasm may not actually have been new, but over the past 40 years or so the kinds of people who tend to congregate in cities out of choice – particularly the unmarried, those with higher education, and/or with cosmopolitan origins – have become *very* much more numerous. Their preferences for living in, and close to the heart of bigger communities, have several aspects, including (for many) a bias toward urban rather than rural leisure pursuits, and a taste for more tolerant (even Bohemian) communities (as Florida, 2002 argued) – but also a perception that these are the best places in which to 'get on', in career terms.

As a popular belief, this idea has a very long history. As a geographic proposition, however, it seems to have been first advanced by Fielding (1989, 1992) [1] who found from evidence for the 1970s that;

> 'as an 'escalator' region, the South East attracts .. upwardly-mobile young adults .. socially promotes them and then encourages their out-migration .. in later middle-age or at .. retirement .. cash(ing) in .. assets .. gained from their passage through the .. region's housing/labour market' (1993, p. 158).

In emphasising the *regional* specificity of this 'escalator', Fielding (1992) relates it to the cultural hegemony within South East England of a modern 'service class' (or salariat), with a cosmopolitan openness to ideas and practices from elsewhere, as against more locally-rooted cultural identities in other regions with stronger agricultural or industrial histories. Alternatively, however, the South East may be seen as synonymous with the London metropolitan economy (Hall, 1989), at the top of a hierarchy of functional *urban* areas – some others of which might also offer mini-escalators. That would be closer to the perspective of the spatial economists who have come to analyse comparable phenomena elsewhere (if in terms of earnings growth rather than class transitions), as an aspect of agglomeration economies, involving thick / flexible labour markets, as well as high order central place functions (Glaeser and Mare, 2001; Glaeser and Resseger, 2010; de La Roca and Puga, 2012).

Fielding's own analyses had two other recognisably geographic aspects to them. One extended to the national scale (and labour migration) a life-cycle residential model more traditionally applied *within* city-regions (for housing/environmentally motivated moves). In the familiar version, young single people are seen as being drawn into inner urban areas offering high accessibility, particularly to work opportunities, but moving outwards in search of affordable space when they formed families - and then ultimately beyond the metro area at the point of retirement when job accessibility ceased to be relevant. In Fielding's longer-distance version, the young – or at least the more ambitious – head for those urban regions where they can get ahead, building an economic position for themselves, which they can take to a comparable role in another region when they have advanced as far as they can on the metropolitan escalator.

The other particular feature in Fielding's (1993) account was an emphasis on the specific economic context of an era (from the 1960s on) in which a new task-based spatial division of labour (Massey, 1984) was intensifying the social class disparities between regions in terms of economic

[1] Though Elias and Blanchflower (1987) had previously identified types of place where young labour market entrants progressed *less* effectively up the occupational ladder.

opportunities. Increasingly multi-regional firms were assigning their routine functions to back-offices or branch plants in areas with slacker labour markets, where such jobs could be more cheaply filled, while concentrating strategic, innovative and market-facing work within top tier city-regions (such as London). Ports of entry to higher status jobs in such firms would also have increasingly been concentrated in this region – with some perhaps in second-order provincial centres.

The importance that Fielding (1989,1992) attached to this factor as the basis of the regional escalator he found as operating during the 1970s was borne out by his subsequent observation that all of the dramatic changes of the next decade - which in Greater London reversed an established pattern of population and employment contraction (Buck et al., 2002) – produced no intensification of the escalator process, simply its continuation (Fielding, 1995). Through an era of massive growth in office-related activities, competitive pressures ensured that London essentially hung on to its dominance in those unroutinisable functions which (as we see it) provide the crucial portals to the escalator as well as the career targets at its end.

One aim of this paper is to extend Fielding's work in a number of directions: updating the evidence base on escalator processes to the 1991-2001 decade; examining whether these are relevant only to mobility into the (top) service class, or operate across the whole range of job statuses; and applying a more specifically urban lens, to see whether there was evidence of (presumably shorter) escalators operating in some second /third order centres as well as in the London city-region.

Beyond these extensions two new questions are addressed in this paper. One is about the extent to which it is (simply) a shift of location from elsewhere into one of these escalator regions that brings advancement, or whether (for migrants or natives) this develops over time through an accumulation of experience 'on the escalator'. The other asks whether either process (simply) reflects a concentration of advantageous job types in the favoured regions, or (also) the influence of broader urban externalities. These each seem relevant to the big 'welfare' issue: of whether such escalators make a substantial contribution to the national economy through the creation of new economic assets (in the form of human capital), or just offer privileged access to better careers for a favoured group. They could also have a bearing on the question of why flows of net migration to core regions continue if such flows actually play the equilibrating role conventionally claimed for them (Evans, 1990). In pursuing each of these, we shall pay some particular attention to the (so far neglected) question of what roles specific sectors of employment play in this process, for individuals and/or areas.

2. Literature: Theory and Existing Evidence

Versions of this escalator phenomenon have recently been investigated from two perspectives. One strand has involved population geographers, interested in the relationship between spatial and social mobility; essentially in terms of moves across regional and class boundaries, and mostly in a British context (Fielding, 1992, 1993; Findlay et al, 2009; Champion et al., 2013). The other strand has involved spatial economists, interested in dynamic aspects of agglomeration economies within big city labour markets; focusing on geographic variations in rates of earnings growth for individuals, in both North American and continental European contexts (Glaeser and Mare, 2001; Glaeser and Resseger, 2010; de la Roca and Puga , 2012; Newbold and Brown, 2012). Migration does figure in their work, but essentially as a means of separating spatial effects from those of individual attributes (to which the geographic studies paid little attention, even in relation to observable characteristics).

Following Fielding, however, geographers have treated mobility – both into and subsequently out of the escalator region(s) – as an intrinsic, indeed central, element in the process.

2.1 Spatial Influences on Labour Market Advancement

Until Findlay et al (2009) the population geographers actually made no clear distinction between: *one-off* boosts to occupational position secured simply by relocation from a less to a more advantaged regional context; and the *continuing* advances which may be achieved (with some effort) in a more dynamic labour market – by established residents (with appropriate qualities) as much as by in-migrants. This distinction has been much more central to spatial economists' studies of earnings change, where one-off effects of migration have been characterised in *productivity* terms (reflecting spatial disparities in the use made of human capital), while the continuing impacts have been identified with *learning* effects (involving increments to human capital). This paper applies that distinction to the more specific issue of occupational progression, treated more or less as in Fielding's studies, and retaining his *escalator* term, but restricting it to the continuing effects of location on (all) resident's economic progress, while labelling the one-off impacts of migration as *elevator* effects (as in Gordon, 2013[2]).

Drawing then both on the (Fielding-inspired) work of 3333333population-geographers and the urban labour market focus of (Glaeser-inspired) spatial economists, our perspective is framed in terms of the potential influence of different city-regional contexts on the prospects of advancement (or retreat) on the occupational ladder. As we see it, these depend on the accumulation (or depletion) of human (and social) capital, with advancement requiring the combination of particular personal capacities/motivations ('*dynamic human capital'*) and access to specific types of job ('*opportunities'*) which offer their occupants a real chance of acquiring marketable assets, in terms of tacit knowledge and connections (Gordon, 2012). Both the distribution of these two factors and the way in which they interact are hypothesised to vary geographically, at the scale of broad city-regions.

More specifically, we see the city-region of location as affecting an individual's occupational trajectory in four main ways:

(a) as the context for pre-labour market socialisation, with different community, labour market and family influences affecting educational achievement and motivation;
(b) through the effect of the scale and mix of local jobs on the availability/value of *opportunities* for on-the-job development of human/social capital;
(c) the local chances of converting such assets into an appropriate jobs, given the relation between labour market tightness and employers' hiring standards; and
(d) the varying risks of getting 'bumped down' the job ladder (and then losing human capital) in local economies with differing degrees of exposure to redundancies.

Of these, the first and last are seen as shaping relatively durable personal attributes in ways that may not readily be modified by relocation. The second and third, however, could offer strong motives for labour migration, aimed at securing upgrading through, respectively, (continuing) escalator effects or (one-off) elevator effects – or both. Either would be economically functional, in securing more productive use of a current stock of human assets. It is the escalator function, however, that seems (*potentially*) the more significant, as a path through which agglomeration could

[2] Our usage of this distinction parallels that of Newbold and Brown (2012), picking up on the continuing upward movement (over time) of those on an escalator, until they 'step off' (Fielding, 1992). It is at odds, however, with the usage of Findlay et al (2009), who see the escalator's distinguishing feature as the horizontal (spatial) movement required to achieve any upward shift.

contribute both to productivity levels and economic dynamism, by enabling a faster and market-directed upgrading of skill stocks.

2.2 Who Gets Moved Up (or down)?

For both escalator and elevator effects, there are reasonable grounds to expect a concentration of benefits among a minority including younger, better-educated, ambitious and/or more (geographically) mobile individuals – though how these work out may be quite different.

In relation to *age,* the logic of the elevator process - offering migrants to a stronger region a one-off occupational advance, with an earnings increment that should persist just so long as they remain there, and in work – means that the payoffs are greatest for young workers (cf. Sjaastad, 1962). The young may also have the greatest chance of having their untapped potential recognised when they make such a move. If they succeed in this, then the incentive would be to remain until they retire – when (affordable) quality of life considerations may draw them elsewhere.

The logic of the escalator process is different, however, because it yields an embodied asset that beneficiaries can take with them to another region, though remaining in the escalator region (despite off-setting factors) offers the prospect of continuing enhancement of these assets. This may well slow over time, because all the crucial knowledge and connections have been acquired, or because the will and capacity to pursue them fades. At some point, well before retirement, 'stepping off the escalator' with a move (on or back) to a region with fewer learning opportunities, but where accumulated assets could still be deployed without any necessary loss of status could well be an attractive option. Where the learning period is condensed, this might be quite soon – as e.g. in those organisations which use a core region headquarters to fast-track development of potential leaders for provincially-based operations.

Among *other personal attributes*, in the elevator case formal qualifications may well make recognition of potential easier (at least for the young) but since moves to a stronger labour market may have to be made speculatively (before securing a job), a positive attitude to risk could be a key sorting factor (Molho, 1986; Williams and Balaz, 2012). In the case of escalator effects, however, what seems crucial is a capacity to effectively exploit informal learning opportunities, using forms of 'dynamic human capital' that encompass both learning skills and motivation. This may well be signalled by success in higher education, but needs to be allied to a level of job-related ambition involving both career goals and intrinsic interest in a line of work (Gordon, 2012).

Spatial mobility is intrinsic to the elevator process, but has also been suggested as a factor enhancing progress up a particular region's escalator (Fielding, 1992). The grounds for this are unclear, however, and it may well be just that migrants share various traits (youth, higher education and lack of attachments) that favour progress up the escalator for migrants and locals alike.

Though less discussed, *sector of employment* is another likely influence both through industry-specific escalators and the way these interact with specific features of urban agglomerations. Direct industrial effects might reflect variations in firm size or intensity of market competition, but particularly of factors which:

- incentivise employers to encourage workforce development to fill new roles;
- weaken barriers to upward mobility by talented young recruits; and
- place a premium on accumulation of tacit forms of knowledge.

These are probably more common in dynamic, knowledge-intensive sectors, but could be expected to operate most strongly in agglomerations that share their characteristics and house the most strategically critical functions of these sectors.

2.3 Empirical Evidence

The original evidence for a (pure) escalator effect involved a simple comparison of rates of advancement from working class to professional/managerial jobs among non-migrants in English/Welsh regions (during the 1970s), which were found to be substantially higher in the South East than elsewhere (Fielding, 1992). This might simply have reflected a bias toward the white (rather than blue-) collar working class in that region. In fact, however, the qualitative finding remains when attention is restricted to those starting in a white collar job, and applies as much in the 1980s, as in the 1970s, and even more in the 1990s (Champion et al., 2013). But it still might reflect inter-regional differences in levels of educational attainment etc. which were not controlled for.

Studies by spatial economists, measuring advance simply in terms of earnings growth – and introducing such controls – also tend to show greater progress among those with longer work experience in major metro areas. In the US, Glaeser and Mare (2001) found this to be the case for residents of *large* metros (with 100K+ population). Subsequently Glaeser and Resegger (2010) refined this observation, identifying the key factor as not sheer size but the proportion of graduates in a metro's *workforce* - though it seems as likely that the share of knowledge-based *jobs* might have made the difference. In a similar Spanish study, De la Roca and Puga (2012) found that time spent in the two leading cities (Madrid and Barcelona) yielded substantially faster growth in earnings (with a more modest gain from experience in the next tier) - and that 90% of this dynamic (escalator) effect was retained after subsequent moves to lower status cities[3].

There is counter-evidence, however, in Newbold and Brown's (2012) Canadian study, comparing the earnings trajectory of migrants to Toronto (as the most likely escalator city) with a matched sample moving elsewhere. This showed that, while Toronto migrants seemed to do better, especially when they stayed longer, they had already been enjoying faster earnings growth before the move, and there was no evidence that being in Toronto significantly accelerated this. Given quite strong general tendencies for mean reversion in earnings (and occupational status[4]), however, it is open to question whether that trend would have continued unabated, had they moved elsewhere than Toronto.

Evidence on *elevator effects* in relation to labour market advancement is much more limited. Population geographers have generally made no distinction between static and dynamic components of the status changes recorded for migrants. The exception is a (small) survey of employed graduate migrants to the South East which found advances achieved at the time of the move to be at least as important as those achieved subsequently (Findlay et al, 2009 a). Spatial economists, on the other hand, do provide clear-cut evidence of gains in *money* earnings from moves to higher order city-regions (e.g. de la Roca and Puga, 2012; Newbold and Brown, 2012) – but not (so far) that these amount to more than simple compensation for differences in living costs.

Existing evidence is also fragmentary about the degree of *concentration of escalator/elevator effects* among people with attributes that generally favour advancement - the younger, more educated, and

[3] though the (static) elevator effect was reversed, as would be expected.

[4] See section 4 below and Gordon (2013).

mobile groups, plus the most motivated and well-connected – or how far their personal success may actually depend upon being in the right place. The most general finding in this regard is that escalator benefits accrue mostly during the early years of work-experience within a city-region. This is implicit in British population geographers' observation that migrants who accessed the South East's escalator, and subsequently 'jumped off', mostly did so before the age of 30 (Findlay et al, 2008; Champion, 2012), rather than waiting until late middle age as Fielding (1992) had suggested. More directly, spatial economists have shown that marginal returns to experience in the best places approach zero after 15 years or so (Glaeser and Resseger, 2010; de la Roca and Puga, 2012). Similarly, a long term analysis of occupational progression concluded that 'escalator effects may only really apply while people are in their 20s and early 30s' (Gordon, 2013, 10).

Beyond this, de la Roca and Puga (2012) find stronger impacts of their urban escalators among individuals with unobserved attributes generally favouring higher earnings. And, rather more specifically, Gordon (2012) reports that occupational gains from South East England's escalator have depended on possession of a certain level of job-related ambition.

2.4 Research Questions and Hypotheses

From this combination of theory and past empirical research, we drew 3 main sets of hypotheses for investigation, namely:

1. that occupational attainment is affected both by location and relocation, but with different logics, geographies and implications;

2. more specifically: that *elevator* effects, accruing to migrants should depend primarily on differences in labour market tightness, affecting the job status achievable with given assets; while *escalator* effects, should enable residents of the more dynamic agglomerations with high order roles to progress through development of valued sorts of human/social capital; and

3. that benefits will be unevenly distributed in both cases; with young people in expanding activities gaining most from the elevator; while escalators benefit mostly young, qualified and more ambitious groups

In the analysis that follows these hypotheses are investigated in turn, using information on occupational progression between 1991 and 2001 by residents of English/Welsh city-regions.

3. Methods[5]

3.1 Data, Sample and Variable Definition

Our analyses use micro-data from the Office of National Statistics' (c. 1% sample) Longitudinal Study (LS) for England and Wales, on changes in place of residence and occupation between the 1991 and 2001 Censuses. In order to exclude those whose job choices at one or other points might least reflect their occupational capacities. our sub-sample (of some 145,000 cases) was restricted to those of working age at *both* dates and recorded as in employment (out of education) in 1991.

[5] A fuller account of data and methodological issues can be found in the online Appendix..

The outcome measure of occupational progression is an index of job status (JS) which (following Nickell, 1982) is based on the log earnings of reported occupations (at SOC90 3 digit level), benchmarked for a single period (and a representative region and firm size[6]). Though it lacks information about managerial/supervisory responsibilities (cf. Gordon, 2013), this should reflect most job changes that involve significant shifts in status and required capabilities. Working from market evaluations reflecting a wide range of relevant supply and demand factors avoids the kind of prejudgement about which jobs are really better that class-based analyses entail. Scaling in terms of earnings differentials also provides an intelligible indication of what escalator/elevator effects might actually be worth to those involved. Our focus is, however, on assessing and understanding how recognised work capabilities develop (and get eroded) in different contexts – *not* on how their monetary valuation varies between places and over time (or what individuals actually earn).

In our analyses, individuals' JS changes over the decade are regressed on a set of other Census-based indicators, including personal characteristics, spatial location/relocation measures (to identify any escalator/elevator effects), and industrial sectors of employment (to identify/control for advantageous sets of job opportunity). Other selected control variables related to age, gender, qualification level and employment position (part/full-time, and self-employed/employee). Information on more qualitative attributes, such as attitudes, commitment and connectedness, was beyond the scope of the Census data-base – but the combined effect of such unobserved factors was examined via quantile regression (see section 3.3 below)

The functional labour market context was represented by a set of 38 CURDS City-regions (CRs), covering the whole country (Coombes, 2002), with supplementary indicators for 20 'consolidated CRs' (CCRs), including both isolated CRs and polycentric groupings of closely linked ones within urbanised regions[7]. At each level, individual areas were comparable in terms of effective closure, but with large differences in population size (from 0.2 to 14mn. for CRs and 0.3 to 18 million for CCRs).

Control variables were generally in terms of 1991 positions and values. In order to separate pure 'escalator' effects (operating continuously during residence in an area region) from 'elevator' effects (arising on a one-off basis from migration between areas), however, individuals' locations (and industries) in *both* 1991 and 2001 were considered, using forms of semi-dummy explained in the next section.

3.2 Methods and Analytic Issues

A three stage approach was adopted for the analyses, addressing in turn each of the hypothesis sets from section 2.4 (above). In the first, the influence and pattern of geographic and sectoral variables were identified descriptively through inclusion of arrays of (semi-)dummy variables for each sector and area in the JS change regressions. In the second stage, these were then examined in more causal terms, in relation to our hypotheses, using substantive measures of area and industry attributes. The final stage examined interaction effects to assess how far geographic influences on progression were concentrated on a minority sub-set of workers.

In ***the first stage,*** individual level regression analyses were used to derive (and test the significance of) area- and industry-specific estimates of location (escalator), relocation (elevator) and sectoral effects on JS change, using three constructed sets of 'semi-dummies' for each area or industry. For

[6] Using LFS microdata for earnings in 1993-2000.

[7] Details of each are provided in Table A1 and Figure A1 of the statistical appendix.

the escalator (and sectoral) effects, variables for each area (or industry) took one of three values: 1 for individuals recorded in that place/sector at both Censuses; 0.5 for those there at one or other; and 0 for those elsewhere at both. For the elevator effects, the area variables again each took one of three values: -1 for a person present there in 1991 only (an out-mover); +1 for a person present in 2001 only (an in-mover); and zero for those present or absent at both (a non-mover).

In order to control for an expected incidence of mean-reversion - where the initial JS position ascribed to a person on the basis of their 1991 occupation differs from their sustainable occupational position (given market evaluations of their attributes) – a function of the base-year JS was also included as a control variable. This proved very significant, attracting strong negative coefficients in all analyses.

The ***second stage*** was undertaken at a more aggregate level, using the coefficient estimates for the sectoral, escalator and elevator factors as dependent variables in analyses with sets of aggregate indicator variables for sectors or CRs. These had the dual aim of: characterising the *pattern* of each factor; and testing our hypotheses about main *causal influences* on each. The numbers of observations (and hence degrees of freedom available) was necessarily more restricted at this stage, involving just 52 sectors and 38 CRs.

The ***third stage*** returned to the individual level, using summary indicators derived from the first and second stage analyses (for individual and locational/sectoral factors, respectively) to look for evidence as to whether elevator and/or escalator effects were heavily concentrated among some sub-groups of the population and negligible among others. Two approaches were pursued: for measured individual attributes (including migration in the previous decade), interaction terms for spatial and non-spatial 'factors' were simply added to a version of the original (first stage regressions); for more qualitative influences not covered by the Census, we used quantile regressions to provide evidence on overall effects of interactions between the spatial variables and such unmeasured factors This is analogous to de la Roca and Puga's (2012) use of personal effect dummies, in a panel regression to investigate interactions between 'ability' and big city experience.

3. Results

Preliminary examination of the JS change data showed that some 38% of our sub-sample had no occupational change between the Censuses; but, of those who did, the average JS change was +5%. Net gains were particularly concentrated among the young and those in lower status jobs at the outset, though these effects were complicated by gender and qualification level. Among women JS gains slowed during the main child-bearing years, but always remained positive, whereas for men, net downward shifts set in from the late 30s. Among those with tertiary qualifications average progress was lower, because they started off in better jobs; controlling for that effect, however, the more qualified tended to show bigger gains sustained over a longer span (into the late 40s). Sharp inter-sectoral differences were also evident. At one extreme, those working in finance or IT (at 2001) had averaged gains of 10-16% over the decade while, at the other, in retail, land transport and hotels/catering, there were average reductions of 2-6%[8].

[8] Since JS values relate to logged earnings, these change figures approximate the potential impact on income.

4.1: Job Status Change Regressions

The first round of regression analyses of individual level JS changes over this decade confirmed the importance of basic personal attributes (age, sex, qualification level, and 1991 employment status) and of base year JS values, together accounting for 19.6% of the variance (Table 1, column 1). Introducing first the spatial (elevator and escalator effect) variables and then the sectoral ones (in columns 2 and 3) shows each making significant contributions with little apparent overlap between them. The sectoral effect is clearly much more powerful, however, (adding about 4% to the R^2) than the spatial ones effects (which together contribute only about 0.2%). In substantive terms also, a much greater variation is evident in estimated sectoral effects (with a standard deviation of 8%) than in those associated with either location (the escalator) or relocation (the elevator). On this indicator, the two spatial effects seem of much the same importance (with SDs of 2%), though the escalator effects apply to all residents whereas the elevator ones only impinge on migrants, for whom it is the *difference* between origin and destination region coefficients that matters.

Across the industrial 'sectors', about a third (20 out of 52) of the estimated coefficients implied significantly above or below average effects on JS progression for those employed in the activity concerned (in one or both Census years)[9]. In each case the difference was substantively important, with disparities of 18-42% in JS advances over the decade between the top and bottom 10 sectors. Activities in the top group included knowledge-intensive sectors with expanding employment, while those at the bottom include both declining production sectors and others typified by high turnover/low paid 'secondary' type jobs[10]. Since the sectoral variables are defined in relation to employment across the decade (not just where people ended up), these results offer prima facie evidence, at least, of sharply varying impacts from time spent in different sectors on rates of human capital accumulation and chances of occupational progression (implying the existence of 'sectoral escalators' operating at quite different speeds).

In the case of the two spatial effects, the evidence is much less striking, and very few individual city-regions show evidence of either escalator or elevator effects differing significantly from the national average[11] . In fact, across the 38 city regions, for the elevator effect there are just two positive cases (Reading and Cambridge) and a single negative one (Hull); while for the escalator effect there are only a pair of positive cases (Reading again and London). The fact that the positive cases all involve leading centres from the Greater South East (GSE) could suggest a common underlying geographical pattern. But across the full set of areas the estimated elevator and escalator coefficients prove quite uncorrelated. Mapping does, however, indicate some spatial patterning for each, with the middle of the country displaying more positive results for the elevator, whereas for the escalator advantage seems to be concentrated within the GSE.

4.2 Accounting for Sectoral and Spatial Variations in Job Status Change

The second stage in the empirical analysis involves seeking to translate this evidence of uneven sectoral and spatial effects into intelligible patterns that can be related to our hypotheses and the findings of previous studies. Though our hypotheses are mostly spatial, the sectoral dimension is also examined first since direct industrial effects at the individual level might spill over into areal effects differentially affected by patterns of industrial specialisation.

[9] These sectors are listed in Table A3 of the statistical appendix.

[10] In these jobs, regression estimates of the 'sectoral' effect estimated are much more negative than the actual changes cited earlier, because they control for mean reversion and youth factors that should boost JS gains for their workforce.

[11] Shown in Table A4 of the statistical appendix..

Among the sectoral characteristics that seem potentially relevant to explain the great variation in effects identified in the initial regressions are: employment growth rates over the decade (as an index of employer need to grow skills); average qualification levels of the workforce (as an indicator both of knowledge/innovation-intensity and worker orientation to learning); the share of jobs in establishments with over 50 workers and employees' average years of service (as indicators of investability from the employer's perspective); and the actual proportion of workers with significant recent training. Exploratory regressions suggested that each of these variables had some relevance, but the strong bivariate relation with training experience disappeared once qualification levels were controlled for (Table 2). This latter factor emerges as the crucial one in distinguishing those sectors which facilitate upward mobility by workers, suggesting that the knowledge-intensity of an enterprise (or perhaps of an establishment) strongly conditions the potential for on-the-job learning[12]. But positive employment growth and greater workforce stability (in terms of average job tenures) also appear significant positive factors.

Turning to the city-region coefficient estimates on escalator and elevator variables, we approach these first descriptively, to see how they relate to key indicators of urban versus regional differentiation, before investigating more substantive associations with causally relevant variables. For this purpose, three broad regions are distinguished (the GSE 'core', a northern/western 'periphery', and a 'middle England' residual), while urbanity is represented by (logged) population size of the relevant CR/CCR scales, and/or a combined 'agglomeration' index giving equal weight to both[13].

Consistent with our hypotheses (in section 2), the results of this exercise (as reported in Table 3) highlighted a clear *regional* variation in values on the elevator factor (being significantly lower, by about 2%, in the periphery, though little different in the other two super-regions) and a significant association between escalator coefficients and *agglomeration*, with no systematic regional variation. An important finding from examination of kernel plots/regressions[14] was that this latter relation did not simply (or even primarily) depend on the strength of the London CR's escalator. Indeed for the combined CR/CCR agglomeration index, the relation between escalator values and logged population was a convex one, rising across most of the range of CRs, but effectively flat for city-regions with populations of 1.5 million or more (about the size the Leeds CR) or others embedded within a London CCR covering virtually all the GSE.

This evidence that there are some clear (but distinct) geographic patterns to be explained for the two spatial factors was followed up by looking for evidence of more causal associations. The estimated values for each spatial factor were regressed on a small set of more substantive variables, reflecting both our initial hypotheses and the role identified for sectors of employment at the individual level in the first stage regressions. The set of independent variables comprised:

- industrial mix, favourableness for individual JS progress[15]
- occupational structure (% professionals and large-firm managers)
- proportion of graduates in the (1991) working age population
- the 1991 unemployment rate (as an indicator of labour market slack)

[12] The full range of qualification levels appears to be relevant, not simply the proportion of graduates – indeed when the latter is added as a separate variable it attracts a negative coefficient

[13] In effect this adds to the city-region's own population base half of that in (any) other areas within the CCR).

[14] Shown in Figures A2(a), (b) and (c) of the statistical appendix..

[15] Averaging individual scores on the sectoral semi-dummies.

- agglomeration, (using the combined CR/CCR measure), included as an indicator of likely labour market flexibility and informational externalities.

In the case of the elevator effect, the regression results (presented in Table 4) offered support only for the hypothesis that gains of this kind derived simply from quitting city-regions with a weak pressure of labour demand (where human capital assets might be supposed to be under-employed) for regions with tighter labour markets (where people with equivalent qualities and experience might access better jobs). Neither skill stocks, the employment mix, nor labour market thickness appeared to exert significant effects in this case.

For the escalator case, by contrast, all of these attributes of the CR of residence seemed to affect rates of progression. In particular, a concentration of *jobs* in higher level occupations and dynamic knowledge-intensive sectors – as well as agglomeration – did seem supportive of faster occupational progression, as hypothesised earlier. This finding has echoes of Glaeser and Resseger's emphasis on the positive effects of a concentration of graduates, except that it relates to *demand-side* externalities. Indeed controlling for the job mix, the impact of a larger proportion of graduates appears to be negative – suggesting that tightness in a city-region's graduate labour market may serve to stimulate upgrading of the workforce through on-the-job talent development. The fact that agglomeration effects are not displaced by including either of these variables (in contrast to Glaeser and Resseger's findings) reflects the more tightly integrated (less pluralistic) urban system of England and Wales, as compared with the US. However, the significance which we find for the knowledge-intensity of local employment (as distinct from the qualification level of workers) is consistent with our hypotheses about the importance of the opportunity structure, and may have much more general significance.

The locational effects which we have identified on occupational achievement are significant and intelligible, but relatively modest in scale. For example, we find that moving out of the slack demand regions adds just 2% to the JS score, while ten years' residence in a major agglomeration would raise this score by some 5% more than in the least populous city-region. By comparison, de la Roca and Puga (2012) report that the *first* decade of work experience in Madrid adds 20% in earning power over and above what could be gained in an average Spanish city. In part this difference may reflect the fact that we have ignored all the progression that people can achieve within an occupational category. But it may also be that our averaging of escalator impacts effects across (virtually) the whole workforce, conceals the extent of gains achieved by some sub-groups figuring more strongly in the experience-based analyses. Therefore we turn now to look for evidence of such variation.

4.3 Variations/Concentrations between Sub-Groups

To address this question, and our third set of hypotheses, we return to the individual level analysis of JS change, looking first for evidence of significant interaction between the main personal and situational effects already identified, and then for evidence in quantile regressions of interactions between the situational effects and unobserved personal attributes. For this purpose, we start from a more parsimonious version of the original regression model: replacing the arrays of locational variables with a population-based agglomeration index (to capture the escalator effect), and the difference in (base year) unemployment rates between individuals' 1991 and 2001 area of residence (to capture the elevator effect); and summarising the effects of the substantive variables in five 'factors', relating to: employment sector ('knowledge industries'), age/sex ('youth'), and (base-year) employment position, qualifications, and JS status ('mean reversion'). To test whether (earlier)

migrants enjoyed stronger escalator effects, a dummy variable for inter-CR migration during the *previous* decade was also included.

The analysis of interactions with personal factors identified a number of significant effects, though these were stronger for the sectoral factor than with the locational variables. In particular these suggested that younger people and also (unexpectedly) the less-qualified gained more in terms of occupational advancement from working in the 'knowledge industries'. For the locational variables, however, there was no evidence that qualifications affected the strength of either escalator or elevator effects. There was a significant positive interaction effect between the agglomeration index and the reversion factor, implying a stronger tendency to equilibration from atypically high/low status positions in the larger urban labour markets. In relation to our hypotheses, the significant results were that the young did prove to be substantially more responsive to both escalator and elevator effects, whereas there was no evidence that (previous) inter-CR mobility affected either (Table 5).

Although youth thus seemed to boost both kinds of spatial effect, disaggregated JS regressions for specific age groups showed it to operate in quite different ways for escalator and elevator effects. In the former case, there seem actually to be clear gains right through the working age range, though the impact was between 3 and 4 times as strong among those aged under 25 (at the start of the decade) as among the over 40s (Table 6). This looks broadly consistent with the evidence from the spatial economists (reported earlier) on the attenuation of gains from experience over extended periods in a metro region. In the case of the elevator effect, however, significant gains were concentrated much more narrowly, just among those aged 20-24 at the start of the period. This pattern is at least consistent with the idea that among migrants from slack labour markets, it is the youngest who are most likely to be recognised by employers elsewhere as having unexploited potential, not yet being durably marked down by/for their work histories. And this age group (including recent graduates) is important as both the most mobile and London-oriented of all.

To explore the last of the hypotheses, about the potential impact of dynamic (but unmeasured) personal attributes in reaping greater returns from the opportunities offered by spatial escalators or elevators, we turn to quantile versions of these regressions. The rationale is that different points in the error distribution from a common JS change regression should reflect the value of these dynamic assets, and that if these reinforced contextual factors the latter would attract significantly higher coefficients in regressions for the higher quantiles. For intelligibility, the substantial proportion of individuals with an unchanged occupation has been excluded from this analysis[16], explicit interaction effects have been omitted, and summary results are presented just for the quartiles (Table 7). From these it can be seen that almost all variables (other than the qualification factor) showed significant variations in coefficients, implying a general tendency for their effects on individuals' progression to be conditioned by some important unobserved influence. This is most striking in the case of (negative) ageing effects (i.e. the inverse of the youth factor) which seem to bear down most strongly on those whose unobserved attributes (e.g. dynamic human capital) are generally least advantageous. In relation to the (positive) escalator and elevator effects – represented here by the agglomeration and differential unemployment variables - the logic is reversed, in that those who gain most from these seem to be those who are best endowed in these terms. For the escalator effect at least this is consistent with the hypothesis about the role of job-

[16] An adapted Heckman procedure was used to control for possible sample selection bias. Exclusion of those without any occupational change naturally inflates all coefficient estimates, by around one third. After allowing for this, however, only estimates of the reversion factor appeared sensitive to inclusion/exclusion of the no-change group (see Table A7 of the statistical appendix).

related ambition – while for the elevator it is at least credible that such ambition could enhance the perceived potential of some of the previously under-employed migrants from depressed regions.

Inspection of coefficients on the relevant (agglomeration and differenced unemployment) variables across a finer set of quantiles confirms that the inter-quartile variation is part of a more general pattern extending across the full distribution[17]. The relation is not simply linear, however, but in each case involves zero effects at the very bottom of the distribution, with monotonic increases up to the 65% quantile, and then effectively flat-lining. For the escalator this is broadly consistent with Gordon's (2013) finding about the relation with a (survey-based) measure of job-related ambition, with those in the top 60% *as a whole* showing similarly strong benefits in terms of occupational progression from residence in an escalator region, while the few with zero ambition experienced none.

Age disaggregated analyses demonstrate that this heterogeneity in impacts of both escalator and elevator processes operates across the age ranges – with the two sources of variation in their strength (youthfulness and unobserved personal attributes) compounding. Among the upper quartile of the younger working age groups (who we might think of as the young *and* ambitious), the estimated impacts of escalator/elevator effects are each roughly *double* the mean values reported at the end of section 4.2.

5. Conclusion

Two decades after the period in which Fielding (1989) found a social class 'escalator' operating in South East England, it still appeared to be functioning at least as effectively, and maybe more so than before the 1990s (Champion et al., 2013). Broadening the focus to consider progression across the full range of occupations, while controlling for a range of personal factors which might have exaggerated the role of the region in simple comparisons, we still find this escalator to be a significant influence on differential rates of labour market success within England and Wales. Neither London nor the wider South East region, however, actually seems to have a monopoly on its operation. And, though these may contain the most supportive kinds of opportunities for those with job-focused ambitions and display the strongest inter-class mobility (Champion et al., 2013), we find purely locational advantages to be about as strong in second and third order CRs (such as Manchester or Leeds)..

Two latent ambiguities in Fielding's original work involved the questions:

- whether the escalator is really a *regional*/cultural phenomenon (of South East England as home to the dominant class) or an *urban*/economic one (peaking in London as a largest agglomeration and highest order centre); and
- how crucial geographic *mobility* is to social progression, as distinct from simply *residence* within an escalator city or region.

In this paper we make a much sharper distinction between the pure escalator, available to all residents of the advantaged areas, and an elevator, potentially raising or lowering the position of labour migrants according to the direction of their movement. And, consistent with our theoretical hypotheses, we find empirically that:

- the elevator is an inter-regional phenomenon directly reflecting differences in the relative tightness of spatial labour markets; while

[17] See Figures A3a and A3b in the statistical appendix.

- the escalator is an urban phenomenon reflecting both pure agglomeration and the concentration of advanced activities and expanding sectors in the 'highest order' city-regions, and does not privilege migrants over established residents in its effects.

As we see it, agglomeration is supportive of occupational progression – as of the accelerated earnings growth found by Glaeser and Resseger (2010) and de la Roca and Puga (2013) - because of its contribution to 'on the job' development of (largely tacit) capabilities and productive connections, particularly by those with some measure of 'job-related ambition', for whom it continues to display a particular attraction. Part of the connection with agglomeration doubtless lies in the potential that thick labour markets offer for parlaying occupational success into pecuniary advantage, as Glaeser and Mare (2001) argued. But it also reflects the superior kinds of capability (and networks) to which an occupationally ambitious member of a local 'community of practice' can gain access in the context of successful urban agglomerations. Put crudely, it is the kind of job opportunities available that matters – more than a simple concentration of human capital. This factor must also be true in relation to very strong *sectoral* escalators which we find operating in knowledge-intensive and dynamic activities.

But it is also a matter of the structure and spatial/organisational articulation of such communities (Amin and Roberts, 2008). In addition to the sheer quality and marketability of opportunities, the advantage of the major urban agglomerations for the occupationally ambitious seems to stem *partly* from the potential for accumulating a distinctive portfolio of capabilities from a range of different local practice communities (Iskander, 2013), *partly* from the extension that their overlaps provide across the wider city regions and amalgams of these - which our results show to be the relevant scale for strong escalators - and *partly* from the active interfacing with international knowledge networks achieved within the highest order city-regions and the most dynamic sectors.

As Fielding (1989) suggested, occupational 'escalators' in core regions / agglomerations seem to be a significant element in the complex of 'cumulative' processes sustaining and reinforcing uneven spatial development within countries such as the UK. They do need to be seen, however, as producing not simply social advancement but real additions to human capital and productive capacity at the national/continental scale, which are not lightly to be cast aside in the interests of greater spatial equity. The results of our analyses suggest, however, that London – and even the wider Greater South East – are not unique within a British context in their capacity to promote escalation, which could also be pursued in second and third order cities/CRs. They also point to the critical importance of concentrations of the kind of job offering advanced learning opportunities, and not simply the availability of 'talented' and qualified workers for securing occupational upgrading in CRs outside the Greater South East.

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Table 1 Summary of First Stage 1991-2001 Job Status Change Regressions

Variable Sets Included	**1**	**2**	**3**
Personal Attributes	x	x	x
1991 JS Value	x	x	x
Industry Effects			x
City-Region Escalator Effects		x	x
Elevator Effects		x	x
SD of coefficients industry effects	..	..	0.084
escalator effects	..	0.021	0.020
elevator effects	..	0.022	0.019
N	145,852	145,852	145,852
R^2	0.196	0.198	0.240
SE	0.261	0.261	0.254

Source: analyses of unpublished 1991/ 2001 Census linked micro-data from ONS Longitudinal Study

Notes: 1. The personal attributes comprised age and log age (both interacted with gender), employment status in 1991 (full/part time employees, self-employed and employers), and possession of a higher (18+) qualification.; 2. Estimated coefficients on these are reported in Table A2 of the statistical appendix.

Table 2 Regression of Sectoral Coefficients on Selected Characteristics

	1	**2**
Constant	-.366 (8.0) ***	-.366 (9.8) ***
Average qualification level	.104 (4.7) ***	.103 (7.2) ***
Employment Growth 1991-2001	.059 (2.6) *	.055 (2.5) *
% with training in past quarter	.000 (0.3)	
% in firms/estabs with 50+ workers	.065 (1.3)	
Average years in firm	.009 (1.9)	.013 (3.4) **
N	50	50
Adjusted R^2	0.686	0.688
SE	.052	.052

Sources: sectoral coefficients from model 3 of the JS change regressions (Table);, establishment size, qualifications and training from Labour Force Surveys for 1996-2000; employment growth from annual employment survey/annual business inquiry (via NOMIS).

Notes : 1. workers' (highest) qualifications are scaled from 5 for a degree to 0 for no qualification; 2. Regressions are weighted in proportion to the square root of numbers employed in each Census; 3 bracketed values are t statistics; asterisks indicate significance *=5%, **=1%, ***=0.1%.

Table 3 Regressions of Spatial Coefficients on Regional and Agglomeration Indicators

	1		2	
	Elevator	**Escalator**	**Elevator**	**Escalator**
Constant	-0.0348 (0.9)	-0.1166*** (3.5)	0.0060* (2.5)	-0.1378*** (4.8)
North + West Region	-0.0159** (3.1)	0.0010 (0.2)	-0.0183*** (4.5)	..
Greater South East	0.0002 (0.0)	0.0042 (0.9)	..	..
CR population (logged)	0.0002 (0.1)	0.0033 (1.6)	..	0.0034 (1.8)
CCR population (logged)	0.0025 (1.1)	0.0049** (2.6)	..	0.0063*** (4.3)
R^2	0.371	0.406	0.336	0.392
N		38		38
Correlation of residuals		-0.258		-0.251

Source: elevator and escalator effect estimates from regression 3 of Table 1
Notes: 1, Observations are city-regions; 2. pairs of escalator and elevator equations were estimated jointly using Seemingly Unrelated Least Squares

Table 4 Regressions of Spatial Coefficients on Employment, Education and Agglomeration Indicators

	1		**2**	
	Elevator	**Escalator**	**Elevator**	**Escalator**
Constant	0.0069 (0.2)	-0.0939** (2.9)	0.0795*** (5.4)	-0.1118*** (3.8)
Unemployment	-0.0455*** (3.6)	0.0086 (0.8)	-0.0512 *** (5.5)	
Graduates	0.0003 (0.2)	-0.0029 (1.6)		-0.0029 (1.8)
High Level Occupations	0.0012 (0.6)	0.0041* (2.2)		0.0038* (2.4)
Industrial Mix (knowledge-intensive and dynamism)	-0.0010 (0.2)	0.0123** (2.6)		0.0115** (2.7)
Agglomeration ?	0.0018 (1.2)	0.0025 (1.9)		0.0037** (3.1)
R^2	0.545	0.535	0.447	0.515
N	38	38	38	38
Correlation of residuals		-.445 **		-0.389*

Source: dependent variables as for Table 3, all other variables from the LS.

Notes: 1. see notes for Table 3; 2. Unemployment and graduate variables relate to 1991; 3. high level occupations variable is mean JS score for 1991; 4. industrial mix variable is a composite based on sectoral coefficients in the individual level regression, and relates nominally to 1996

Table 5 JS Change Regressions: Tests of Interaction with Locational Factors

Variable	1	2
Escalator		
Agglomeration*Youth	0.0027*** (3.9)	0.0026*** (3.8)
Agglomeration*Qualification	-0.0006 (0.7)	
Agglomeration*Knowledge Ind.	0.0004 (0.5)	
Agglomeration*Mean Reversion	0.0019* (2.2)	0.0018* (2.6)
Agglomeration*Migrant 8191		0.0004 (0.2)
Elevator		
UEdiff*Youth	-0.264* (2.4)	-0.276* (2.5)
UEdiff*Qualification	0.0628 (0.6)	
UEdiff*Knowledge Industry	-0.094 (0.8)	
UEdiff*Mean Reversion	0.0033 (0.8)	
UEdiff*Migrant 8191		-0.055 (1.0)
N	145605	145605
R^2	0.240	0.240
RMSE	0.254	0.254

Source: see Table 1

Notes: 1. The dependent variable is (again) JS change between 1991 and 2001; 2. In addition to the reported interactions with spatial variables, the regressions included a set of main effects and additional interactions with the sectoral variable[18]. 2. The interaction terms have been scaled so that coefficients represent the increment to a main effect of a 1 SD shift in value on the interacting factor. 3. t statistics are based on robust standard errors with allowance for clustering of spatial variables.

[18] Full results are reported in Table A6 of the statistical appendix. .

Table 6 Disaggregated JS Change Regressions: Escalator and Elevator Effects by Age

	16-19	20-24	25-29	30-39	40-49/54	ALL
Escalator: Agglomeration Population (ln)	.020*** (6.3)	.017*** (9.0)	.009*** (5.4)	.005*** (4.6)	.005*** (5.0)	.008*** (12.6)
Elevator: Differential unemployment rate	-.155 (0.3)	-1.7124*** (4.2)	-.431 (1.8)	-.325 (1.5)	-.211 (1.0)	-.475*** (4.3)
N	7651	19270	22409	41782	54730	145852
R^2	0.268	0.264	0.238	0.221	0.205	0.240
SMSE	0.292	0.277	0.261	0.249	0.237	0.253

Source: see Table 1

Note: Additional variables in the regressions included the youth, JS1991, qualification, knowledge industry and economic position factors (as in Table 5), together with interactions between the first three of these and the industry factor.

Table 7
Quantile Regressions of JS Change on Personal, Sectoral and Locational Factors

Variable	Upper Quartile	Median	Lower Quartile
Constant	3.421	3.818	3.881
Mean Reversion Factor	1.209	1.319	1.537
Economic Position in 1991 Factor	1.015	1.561	1.418
Youth Factor	0.659	1.226	1.701
Qualification Factor	1.261	1.545	1.312
Knowledge Industry Factor	1.478	1.441	1.385
Agglomeration (log pop)	0.0171	0.0121	0.0091
Unemployment Differential	-0.914	-0.697	-0.267
Inverse Mills Ratio (IMR)	-1.447	-1.558	-0.027
IMR squared	0.851	1.210	0.238
N	90845	90845	90845
Pseudo R^2	0.219	0.166	0.152

Source: see Table 1

Notes: 1. These analyses relate to a restricted observation set (as compared with earlier analyses), excluding all those with the same recorded SOC90 occupation in both Censuses. 2. Variables are defined as in the upper part of Table 5 (excluding the interaction terms). 3 The IMS terms are controls for sample selection bias; 4. The differences between upper quartile and lower quartile coefficients are significant at the 0.1% level for all variables apart from the industry factor (significant at 1%) and the qualification factor (not significant even at 10%)

STATISTICAL APPENDIX

Table A1: City Regions and Consolidated City-regions

City Region	Consolidated City region
Middlesbrough	Middlesbrough
Carlisle	Carlisle
Leeds	Leeds-Bradford-York
York	
Bradford	
Hull	Hull
Sheffield	Sheffield
Manchester	Manchester-Liverpool-Stoke
Preston	
Liverpool	
Stoke	
Chester	Chester
Nottingham	Nottingham-Derby-Lincoln
Lincoln	
Derby	
Leicester	Leicester
Birmingham	Birmingham-Coventry
Coventry	
Shrewsbury	Shrewsbury
Bristol	Bristol
Worcester	Gloucester-Worcester-Oxford
Gloucester	
Oxford	
Cardiff	Cardiff
Swansea	Swansea
Plymouth	Plymouth-Exeter
Exeter	
Norwich	Norwich
Northampton	London Region
Peterborough	
Cambridge	
Ipswich	
London	
Reading	
Brighton	
Southampton	Southampton-Portsmouth

Table A2 Regressions of JS Change : Coefficients on Personal Attributes

	Model 1	**Model 4**
Constant	2.169*** 11.1	2.965*** 15.2
Employment Status, 1991:		
Full-time Employee	0.028*** 10.8	0.004 1.6
Part-time Employee	0.005 1.6	-0.021*** -6.3
Employer	0 .	0 .
Self-Employed	0.031*** 7.5	0.053*** 13.0
Job Status, 1991		
JS Value	-0.797*** -6.0	-1.658*** -12.4
JS Squared	0.206** 2.9	0.571*** 8.1
JS Cubed	-0.038** -3.1	-0.093*** -7.6
Age & Sex, 1991		
Age	0.006** 2.8	0.006** 2.9
Log Age	-0.322*** -4.6	-0.323*** -4.7
Female	-0.559*** -6.8	-0.535*** -6.7
Age*Female	-0.005*** -4.9	-0.005*** -4.9
Log Age* Female	0.196*** 5.8	0.184*** 5.6
Qualifications (18+), 1991		
None	-0.169 -1.1	-0.226 -1.6
None*Age	-0.001 -0.4	-0.001 -0.6
None*Log Age	0.005 0.1	0.027 0.5
Escalator/Elevator Semi-dummies	..	X
Sectoral Semi-dummies	..	X

Source: analyses of unpublished 1991/ 2001 Census linked micro-data from ONS Longitudinal Study

Notes: This table presents results for the personal attribute variables (only) from the regressions summarily reported in Table 2 of the paper.

Table A3 JS Change Regressions: Coefficients on Sectoral Semi-dummies – SIC (2 digit) Divisions with Significantly Stronger or Weaker Job Status Progression

	Coefficient	t statistic	Significance level
Significantly Above Average			
72 : Computing and related activities	0.258	7.0	***
467 : Auxiliary financial activities	0.171	4.5	***
65 : Financial intermediation	0.115	3.1	**
66 : Insurance and pension funding	0.111	3.0	**
30 : Office machinery and computers	0.098	2.5	*
80 : Education	0.085	2.4	*
70 : Real estate activities	0.079	2.1	*
75 : Public administration	0.077	2.1	*
41 : Water services	0.080	2.1	*
73 : Research and development	0.079	2.0	*
17 : Textiles	-0.083	-2.2	*
Significantly Below Average			
52 : Retail trade	-0.097	-2.7	**
90 : Sewage, refuse disposal and sanitation	-0.109	-2.8	**
11/13 : Extraction of oil and natural gas	-0.104	-2.8	**
60 : Land transport;	-0.108	-3.0	**
10 : Coal Mining	-0.121	-3.1	**
19 : Tanning and dressing of leather	-0.126	-3.1	**
18 : Apparel; dressing/dyeing fur	-0.133	-3.5	***
93 : Other service activities	-0.142	-3.9	***
55 : Hotels and restaurants	-0.166	-4.6	***

Source: as for Table A2.

Notes: 1. This table presents (significant) coefficient estimates for sectoral variables from the (model 3) regression summarily reported in Table 1 of the paper; 2. Effect estimates and significance tests relate to deviations from the national mean; 3. asterisks indicate significance levels: * = 5%; ** = 1%; *** = 0.1%.

Table A4 JS Change Regression: City Regions with Significantly Stronger or Weaker JS Progression

	Elevator Effects			Escalator Effects			
	Coeff	**T value**	**Sig**		**Coeff**	**T value**	**Sig**
Significantly Above Average							
Reading	0.024	**2.011**	*	Reading	0.022	**3.468**	***
Cambridge	0.028	**1.984**	*	London	0.014	**2.698**	**
Significantly Below Average							
Hull	-0.048	**-2.832**	**				

Source and Notes: as for Table A3, but for locational rather than sectoral variables.

Table A6 JS Change Regression: Tests of Interaction Effects

Variable	**1**	**2**	**3**
Constant	2.609*** (60.9)	1.833*** (10.4)	1.903*** (11.5)
Main effects			
Mean Reversion Factor	1.0*** (139.1)	0.898*** (19.4)	0.908*** (24.4)
Economic Position 1991 Factor	1.0*** (13.5)	1.022*** (19.0)	1.033*** (19.2)
Youth Factor	1.0*** (31.6)	0.385* (2.4)	0.407* (2.6)
Qualification Factor	1.0*** (80.5)	1.173*** (9.5)	1.007*** (77.1)
Knowledge Industry Factor	1.0*** (80.6)	0.950*** (8.9)	1.002*** (92.0)
Agglomeration (log pop)	.0082*** (5.7)	0.0079*** (12.6)	0.0077*** (11.0)
Unemployment Differential	-0.480** (2.8)	-0.413*** (3.6)	-0.453*** (4.0)
InterCCR Migrant 1981-91			0.0215 (1.1)
Interactions			
K Industry*Mean Reversion		-0.0037*** (5.0)	-0.0035*** (4.7)
K Industry*Youth		0.0049*** (7.1)	0.0046*** (6.7)
K Industry*Qualification		-0.0065*** (7.8)	-0.0064*** (7.8)
Agglomeration*Youth		0.0027*** (3.9)	0.0026*** (3.8)
Agglomeration*Qualification		-0.0006 (0.7)	
Agglomeration*Knowl Industry		0.0004 (0.5)	
Agglomeration*Mean Reversion		0.0019* (2.2)	0.0018* (2.6)
UEdiff*Youth		-0.264* (2.4)	-0.276* (2.5)
UEdiff*Qualification		0.0628 (0.6)	
UEdiff*Industry		-0.094 (0.8)	
UEdiff*Mean Reversion		0.0033 (0.8)	
Agglomeration*Migrant 8191			0.0004 (0.2)
UEdiff*Migrant 8191			-0.055 (1.0)
N	145605	145605	145605
R^2	0.239	0.240	0.240
RMSE	0.254	0.254	0.254

Source: as for Table A2.

Notes: 1. This table presents full results for the interaction models partially reported in Table 5 of the paper. 2. The dependent variable is (again) JS change between 1991 and 2001; 2. the five constructed 'factors' (mean reversion, employment position, youth, qualification and knowledge industry) are specified to attract unit coefficients in the 'main effects' regression (column 1). For the interaction effects, however, each of these (only) has been standardised (with mean zero and unit SD), so coefficients on the interaction terms represent the increment to a main effect of a 1 SD shift in value on the interacting factor. 3. t statistics are based on robust standard errors with allowance for clustering of spatial variables

Table A7 Robustness Test: JS Change Regressions

	Whole Sample	Occupation Changers		Ratio
	(1) OLS	(2) OLS	(3) Heckman Corrected	(1): (3)
Constant	2.001	2.757	2.692	0.74
Main effects Mean Reversion Factor	1.027	1.475	1.458	0.70***
Economic Position 1991 Factor	1.025	1.528	1.639	0.63
Youth Factor	0.276	0.304	0.233	1.19
Qualification Factor	1.168	1.580	1.577	0.74
Knowledge Industry Factor	1.904	2.783	2.768	0.69
Agglomeration (log pop)	0.008	0.013	0.012	0.64
Unemployment Differential	-0.406	-0.409	-0.434	0.94
Interactions K Industry*Mean Reversion	-0.299	-0.275	-0.269	1.11
K Industry*Youth	1.716	2.412	2.411	0.71
K Industry*Qual	-1.472	-3.009	-3.006	0.49*
Agglomeration*Youth	0.057	0.077	0.077	0.74
UEdiff*Youth	-6.346	-12.301	-12.240	0.52

Source: as for Table A2.

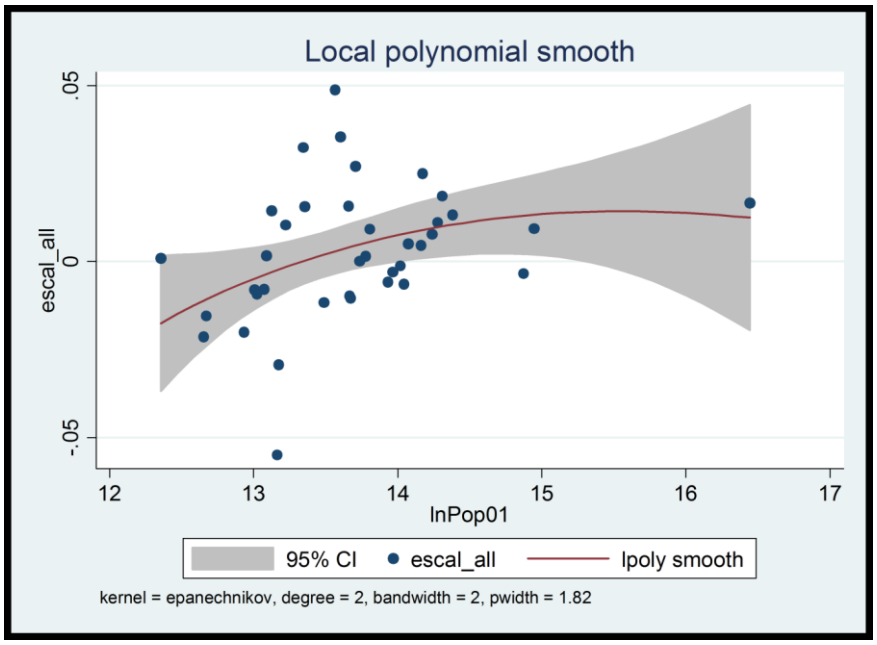
Note: 1. Asterisks in the last column relate to the significance of departures from an overall average ratio of 0.76 (reflecting the dilution of all effects across the full sample including occupational stayers). Significance levels are computed via the standard error of the difference between pairs of coefficient estimates (after allowance for the dilution effect.

Figure A1: Map of the CURDS City Regions

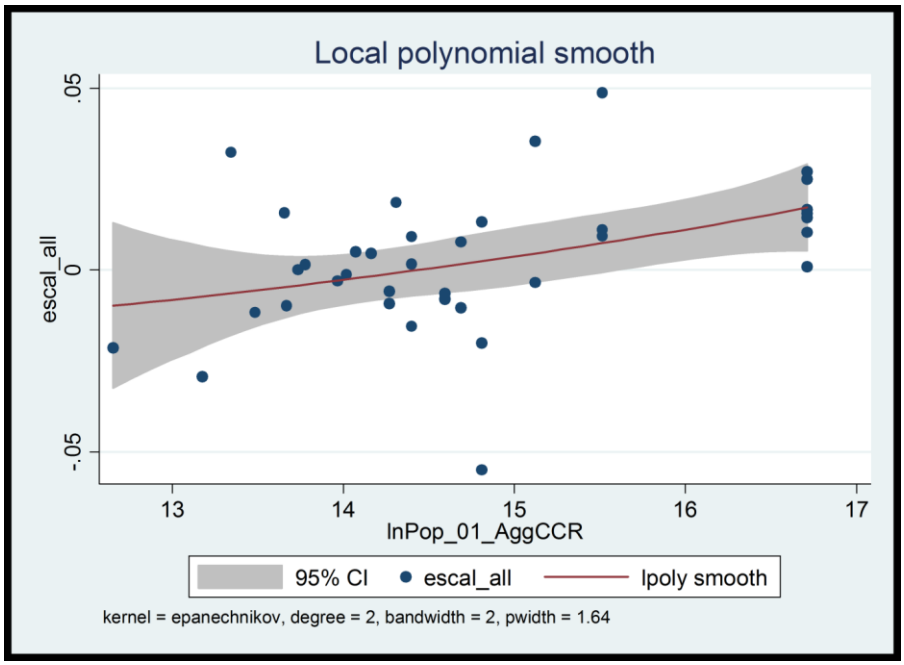
Source: M. Coombes, CURDS, Newcastle University

Figure A2: Plots of Estimated Escalator Effects Against Logged Population Size – with Kernel Regression

(a) City-Regions



(b) Consolidated City-Regions



(c) Combined Agglomeration Measure

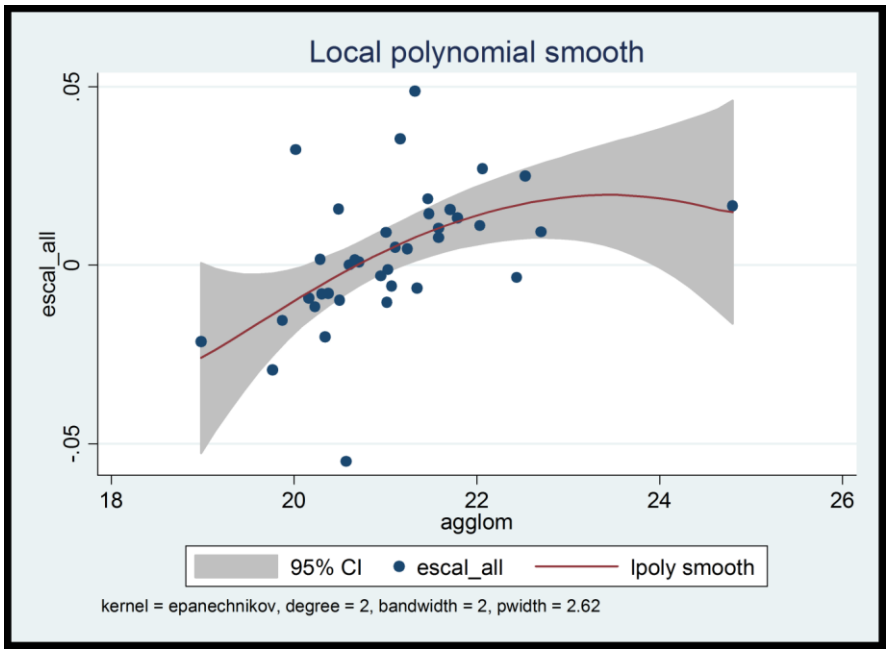


Figure A3 (a) Quantile Estimates of Agglomeration Coefficient

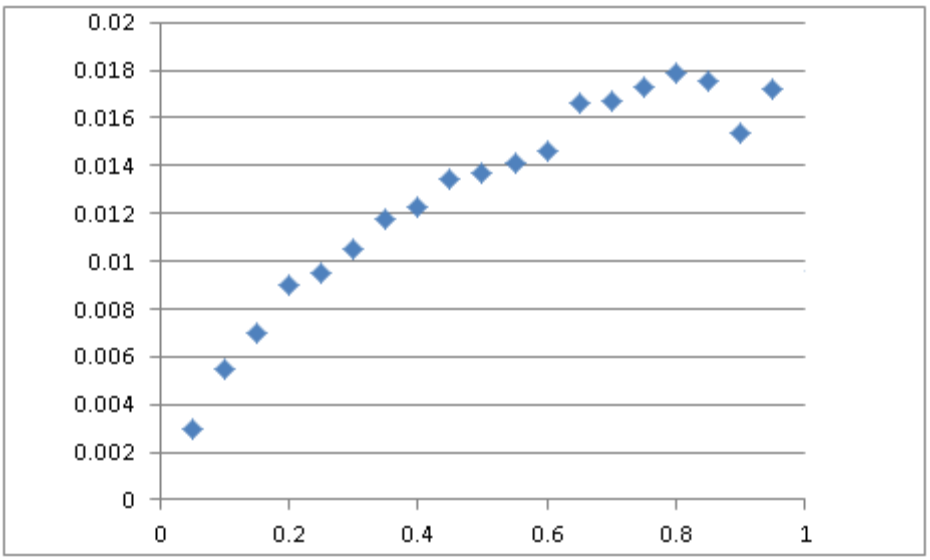
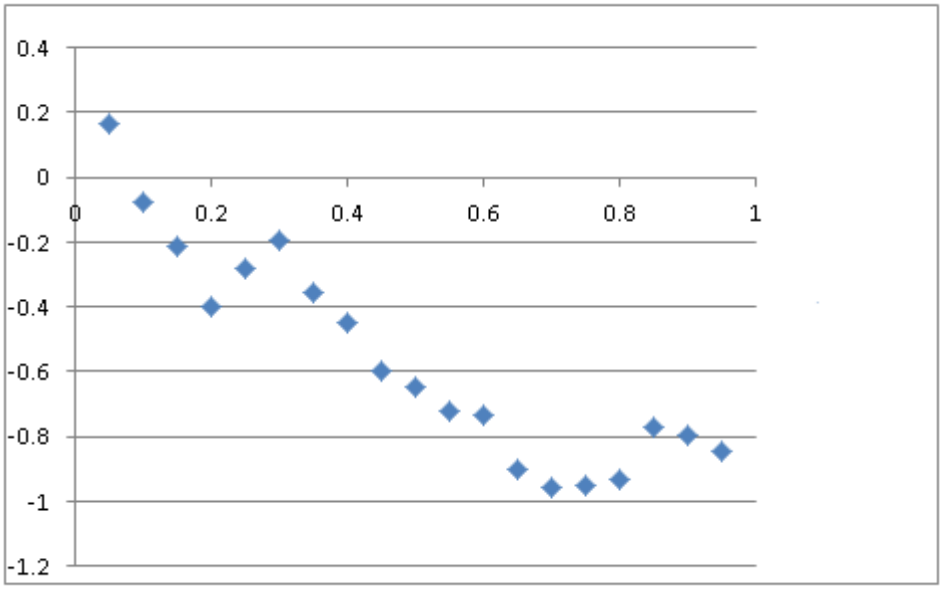


Figure A3 (b) Quantile Estimates of Unemployment Differential Effect



Supplementary Discussion of Methodological Issues

1. The Geographic Framework: City-Regions and Consolidated City Regions

As an approximation to distinct spatial labour markets, the geographic frame adopted for the analysis was a set of 38 CURDS City-regions (CRs), covering the whole country (Coombes, 2002). These are listed in Table A2 and mapped in Figure A1. The scale of these CRs in population terms varies greatly - between about 0.25 and 12 million - but by design (from 1991 Census commuting flow analyses) they are much more comparable in terms of self-containment. This averaged around 81% on a measure reflecting the proportions both of out-commuters among employed local residents (**O)** and in-commuters among those in local jobs (**I) -** combined in the formula: closure = **1-(I + O - I*O).** To address the possibility that relevant labour market processes may operate at a higher degree of spatial aggregation, a higher order set of 20 'consolidated CRs' (CCRs) was also defined, including polycentric groupings of more closely linked CRs in urbanised regions, alongside single CRs elsewhere. These are listed alongside the CRs in Table A1. Their populations ranged between 0.25 and 18 million, with an average closure of 87%.

2. Separating Escalator and Elevator Effects

In the individual level regression analyses of the first stage, area- and industry-specific estimates of location (escalator), relocation (elevator) and sectoral effects were derived using three constructed sets of 'semi-dummies'. Following Marglin (1987) and others, this term is used to indicates a cardinal variable with *some* of the attributes of a dummy. Here, it involves augmenting a dummy variable by introducing a half-way point: for the escalaator/sectoral effects this enables distinction between cases falling within a category at neither, both or just one of the two census dates; for elevator it allows distinction between in-movers, out-movers and non-movers.

In each case, the values of these semi-dummies derive from combinations of CR (or sector) dummies for 1991 and 2001. For the escalator/sectoral variables these approximate the proportion of the inter-censal period through which an individual is exposed to the context of a particular CR (or industry), taking the value 1 for people found there in both Censuses, 0.5 for those present in just one, and zero for those who were elsewhere in both[19]. Coefficients on these provide estimates of sectoral effects (in the industry case) and of escalator effects (in the area case). The other set of semi-dummies, used only for CRs, picks up the (immediate) effect of a locational shift. It takes the value -1 for a person present in the area at the first Census date, but who was elsewhere at the second, +1 for a person present there only at the second date (and elsewhere at the first), or 0 for those who were *either* there at both dates, *or* elsewhere on both. Coefficients on these variables provide estimates of the elevator effects.

Underpinning this simple separation of escalator and elevator effects is a pair of assumptions: that escalators have identical effects on migrants and non-migrants (with the same period of exposure to an area); and that elevators operate symmetrically for those moving into and out of a given area (with gains to one mirroring losses to the other). The first of these assumptions is tested (in stage 3 of the analysis) by comparing escalator effects during this decade for those who did /did not make an inter-CR move in the previous one. The second assumption is not tested here.

[19] This approximation ignores the existence of multiple moves within a decade, which mean that some of those treated as continuous residents will have spent part of the decade elsewhere, while those recorded as movers will on average have spent less than 50% of it in either of the regions where they were enumerated by a Census.

3. Dynamic Issues:

This analysis focuses on change over a single ten-year period, but a couple of issues about the dynamics of job mobility still need consideration.

3.1 Occupational Stayers and Heterogeneity in Propensities to Move

One issue stems from the fact that alongside substantial movement between occupations of quite different status levels, a large proportion of the workforce actually remain in the same occupational position. This was the case for 38% of our selected population group over the decade between the two Censuses. This proportion clearly reduces with longer periods of exposure, but strikingly high figures have also been reported for single year comparisons with the Labour Force Survey, and over 18 years with the British Household Panel Study (Gordon, 2012).

The distribution of JS shifts thus combines two distinct elements, one (closely) following a normal distribution around a near zero mean, the other adding a sharp spike at zero itself. This spike is likely to reflect a number of factors, including concealed (intra-occupational) status shifts, punctuated equilibria in careers, or real heterogeneity between distinct classes of movers and stayers. In any case it implies some heteroscedasticity in the disturbances - though with the potential for bias being limited both by the proximity of the (stayer) spike to the (mover) mode, and a weak relation between mover/stayer selection and other attributes of interest. Logit analyses did show that stayers were significantly more likely to: be old; lack higher qualifications; start from a high JS level (in 1991); be in less dynamic industries (in either year)[20]; and/or live in more peripheral regions. But these associations accounted for only some 2% of the differences from those with a recorded occupational change. For the stage 1 analyses, where average effects across the population were of prime interest, this issue was thus ignored.

Its potential significance was, however, addressed specifically in the quantile analyses undertaken in stage 3. This was necessary because the strong 'spike' effect of a substantial group of job 'stayers' on the error distribution, making estimation of the median function (in particular) across the full sample quite meaningless. The quantile analyses were thus restricted to respondents with some recorded change of (SOC90) occupation between the two Censuses. Potential sample selection bias was controlled for with a Heckman-like procedure, including both the inverse Mills ratio and its square (derived from a conventional selection equation) as controls in the quantile equations (cf. Buchinsky, 2001; and Bosio, 2009)[21]. Though statistically significant effects were found, these were only substantively significant in quantile estimates of the mean reversion factor (see Table A7). Applying the same procedure to the main (OLS) regression results from stage 1, as a robustness check on the effect of including stayers in those analyses similarly revealed no significant biases – beyond the natural dilution of effects relative to those estimated for a sample restricted to those with JS changes. Robustness checks undertaken in stage 3 (where quantile analyses focus solely on movers), however, suggest no significant biases for the variables of interest[i].

3.2 Mean Reversion

The other dynamic issue involves the strong evidence of mean reversion, in terms of a negative relation between JS change and base year levels (as reported also for shorter/longer time scales by Gordon, 2012). In our data, those starting the decade in the bottom quintile had by its end made average gains of 19 %, while (in mirror image) those who started in the top quintile experienced

[20] as listed in Table A3.

average losses of 13%). The relation is actually non-linear, with a flattening at both extremes. In the mid-range occupations (accounting for two thirds of jobs), we found a mean reversion factor over the decade of 53%, compared with over 75% in the top and bottom deciles. This unevenness seems to reflecting a statistical censoring of the extremes of job status (through the graininess of the occupational classification), as well as some effective floor to viable jobs within the formal economy. But over the whole range of jobs, the basic logic is one of (some) 'correction' of discrepancies *between* ascribed Job Status levels in base year employment, *and* an individual's sustainable occupational position, given market evaluations of their human capital assets. As such, controlling for this factor is very important for identification and measurement of other effects, including those of location and relocation and is handled in our models via a cubic function of base-year JS.

A particular case where control for the reversion effect clearly made a difference was in relation to the impact of education levels on progression. At a descriptive level, the inter-Censal evidence was that people lacking a higher (18+) qualification, actually showed a *more* positive trend in JS status over the decade (averaging a 3.4% gain as compared with 1.5% for the more qualified). Those with lower qualification levels, however, naturally tended to be starting from a lower position in the job hierarchy. After controlling for potential effects of regression toward the mean, however, higher education clearly displayed the expected positive influence on progression, favouring much faster JS gains through the 20s, and with advances among graduates continuing into the late 40s.

4 Controlling for Uneven Areal Effects

In the stage 2 aggregate analyses across city-regions – involving a much more limited and heterogeneous set of observations - two potential forms of unevenness in area effects were identified and controlled for in the regressions. The first of these stemmed from the very wide range of CR population levels, with an expectation of substantial heteroscedasticity, in terms of proportionately larger error variances in the less populous regions. This proved to be the case for both the escalator and elevator equations, and was addressed by use of weighted least squares estimators.

The second potential issue to be addressed was that of unobserved/omitted area attributes, and more specifically the possibility that these might have correlated effects on both escalator and elevator processes – including potential displacement of effects between the two spatial factors. In order to try to exploit this possibility to generate more reliable estimates of effects from measured CR attributes, the two equations were estimated jointly, in a Seemingly Unrelated Regression framework. This proved only to be significant for the smaller cases, however, and was unimportant overall when those were down-weighted.

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